

a2 cond 4. (Amended) The apparatus of claim 3, wherein said load lock chamber is a heating or cooling [or heating/cooling] chamber.

a3 6. (Amended) The apparatus of claim 3, wherein [each] said processing island includes two processing chambers.

a4 12. (Amended) The apparatus of claim 1, wherein said substrate transfer mechanism is moveable[,] from a position directly below the substrate on said conveyor when the substrate is in a stopped position adjacent said processing island, to a position engaging the substrate, and then to a final position wherein the substrate is positioned above the conveyor.

13. (Amended) The apparatus of claim 1, wherein [each] said processing island includes an entry load lock chamber, a processing chamber and an exit load lock chamber.

a5 15. (Amended) An apparatus for performing a thin film process on a substrate, comprising:
a conveyor to support [for supporting] a substrate as it moves along a flow path;
a plurality of processing islands located along the flow path, each including:
an exterior,
an interior, and
at least one valve for exchange of the substrate between the exterior and the interior; and
a substrate exchange apparatus configured and arranged to retrieve the substrate from the conveyor, introduce the substrate into the interior of a selected processing

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and.

island, extract the substrate from the interior of the selected processing island, and replace the substrate on the conveyor.

28. (Amended) An apparatus for performing thin film processing on substrates, comprising:
at least one processing [islands, each] island arranged along a work flow path, the
processing island [having] including:

an exterior,

an interior; and

at least one valve for exchange of a selected one of the substrates between
the exterior and the interior;

a substrate delivery and removal system; and

a substrate exchange apparatus [for retrieving] to retrieve the selected one of the
substrates from the substrate delivery and removal system, [introducing] introduce the selected
one of the substrates into the interior of [a] the processing island, [extracting] extract the selected
one of the substrates from the processing island, and [returning] return the selected one of the
substrates to the delivery and removal system;

wherein the substrate exchange apparatus is moveable along the work flow path
between a first position [for retrieving] at which the selected one of the substrates can be
retrieved from the delivery and removal system; [and a second position for returning the selected
one of the substrates] or returned to the delivery and removal system, and an exchange position
at which the selected one of the substrates can be transferred between the interior and exterior of
the processing island.

Please cancel Claim 29.

30. (Amended) The apparatus of claim 28, further comprising a plurality of processing islands and a track extending along the work flow path between [at least] the first position and a second position at a location "distal from the exchange position" [for returning the selected one of the substrates to the delivery and removal system], the track passing adjacent to each of said processing islands[, and the substrate exchange apparatus moveable along the track between the first position and the second position.

33. (Amended) The apparatus of claim 28, wherein the substrate delivery and removal system includes:

a plurality of cassettes [each] to hold a plurality of substrates; and

a cassette loading system [for positioning] to position the substrates on the cassettes [to be retrieved by the substrate exchange apparatus].

Please cancel Claim 34.

35. (Amended) The apparatus of claim 28, wherein there are a [each of said] plurality of processing islands, each including [includes]:

a first load lock chamber having a first valve [for introduction of] through which the selected one of the substrates can be introduced therein; and

at least one processing chamber;

wherein for each processing island, said substrate exchange apparatus may be moved to at least one exchange position to introduce [, including an insertion position for introducing] the selected one of the substrates into the first load lock chamber.

37. (Amended) The apparatus of claim 30 [35], wherein the second position is [substrate exchange apparatus is moveable along the track to] a service position [wherein] at which the substrate exchange apparatus is accessible for maintenance or replacement[, which service position is located beyond all of said at least one exchange positions].

38. (Amended) An apparatus for performing thin film processing on substrates, comprising:

a substrate delivery and removal system;

a processing island including [having]:

a first load lock chamber having a first valve [for introduction of substrates] by which a substrate can be introduced into the first load lock chamber;

at least one processing chamber; and

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a second load lock chamber having a second valve [for extraction of substrates] by which a substrate can be extracted from the second load lock chamber;

a substrate exchange apparatus [for retrieving] to retrieve substrates from the delivery and removal system, [introducing] introduce substrates into the first load lock chamber, [extracting] extract substrates from the second load lock chamber, and [returning] return substrates to the delivery and removal system, the substrate exchange apparatus moveable between:

a first position [for retrieving] at which substrates can be retrieved from the delivery and removal system;

an introduction position, remote [of] from the first position, [for introducing] at which substrates can be introduced into the [interior of the] first load lock chamber; and

an extraction position, remote [of] from said first position and said introduction position, [for extracting] at which substrates can be extracted from the second load lock chamber.

39. (Amended) The apparatus of claim 38, further comprising a track extending among [at least] the first position, the introduction position and the extraction position, and passing adjacent to said processing island, the substrate exchange apparatus being moveable along the track.

40. (Amended) An apparatus for performing thin film processing on substrates, comprising:

first and second conveyors [for supporting] on which substrates can be supported as they move in respective first and second flow paths;

a plurality of processing islands associated with the first and second flow paths and each processing island including:

an exterior,

an interior, and

at least one valve [for] to exchange [of] substrates between the exterior and the interior;

an apparatus associated with each processing island [for retrieving] by which substrates can be retrieved from the conveyor, [introducing substrates to] introduced into the interior of the processing island, [extracting substrates] extracted from the processing island, and [transferring substrates] transferred to the conveyor; and

at least one bypass robot [for acquiring] by which substrates can be acquired from a first location along the first flow path and [transferring substrates] transferred to a second location along the second flow path.

41. (Amended) The apparatus of claim 40, wherein the bypass robot includes:

an end effector [for engaging] to engage substrates;

a first actuator [for] to vertically [translating] translate the end effector;

a second actuator [for rotating] to rotate the end effector about a vertical axis; and

a third actuator [for] to horizontally [translating] translate the end effector.

42. (Amended) An apparatus for performing thin film processing on substrates, comprising:

a plurality of processing islands, each processing island including:

an exterior,

an interior, and

at least one valve [for] to exchange [of] a selected one of the substrates between the exterior and the interior;

a substrate delivery and removal system;

a substrate exchange apparatus [for retrieving] by which the substrates can be retrieved from the substrate delivery and removal system, [introducing the substrates] introduced into the interior of a processing island, [extracting the substrates] extracted from the processing island, and [returning the selected one of the substrates] returned to the delivery and removal system; and

at least one substrate buffer chamber to store the substrates prior to or after processing.

43. (Amended) An apparatus for performing thin film processing on substrates, comprising:

a substrate holding area;

a plurality of processing islands, each processing island including:

an exterior,

an interior, and

at least one valve [for] to exchange substrates between the exterior and the interior;

[a substrate delivery and removal system including] a track passing adjacent to

each of said processing islands;

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a substrate exchange apparatus [for retrieving] movable along the track to retrieve substrates from the substrate [delivery and removal system, introducing] holding area, introduce substrates into the interior of a processing island, [extracting] extract substrates from the processing island, and [returning] return substrates to the substrate holding area [delivery and removal system, the substrate exchange apparatus moveable along the track, and], wherein the track includes at least two modular tracks with conjunctible interfaces, [such that] the track [may be] being configured or extended by combining a plurality of said modular tracks.

44. (Amended) An apparatus for performing a process on a substrate, comprising:

a conveyor [for supporting] to support a substrate as it moves along a flow path;

a plurality of processing islands located adjacent to said flow path, each processing island including a load lock heating chamber through which a substrate may be introduced into said processing island and in which a substrate can be heated, a processing chamber in which a process may be performed on the substrate after it is heated, and a load lock cooling chamber in which the substrate may be cooled after it has been subjected to the process in said processing chamber; and

a substrate transfer mechanism configured and arranged to transfer the substrate between said conveyor and selected ones of said processing islands.

45. (Amended) An apparatus for performing a process on a number of substrates, comprising:

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a conveyor to support the number of substrates along a work flow path at a number of predetermined positions separated by a first pitch;

a plurality of substrate transfer mechanisms configured and arranged to remove the substrates from and place the substrates on said conveyor; and

a plurality of processing islands located along said flow path, at least one of said plurality of processing islands having at least two adjacent chambers separated by a second pitch [and further having a valve for introduction and extraction of one of the number of substrates into and out of an interior thereof, and such that], the second pitch between the adjacent chambers being substantially equal to or an integral multiple of the first pitch between [adjacent substrates] the predetermined positions on the conveyor [and the pitch between adjacent chambers in said at least one processing island is substantially uniform].

Please add the following claims:

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--47. An apparatus to perform a process on a substrate, comprising:

a substrate storage location at a first end of a substrate processing path;

a plurality of process chambers located adjacent to the processing path between the first end and a second end of the processing path;

a transfer robot movable along the processing path to retrieve a substrate from the substrate storage location, move it along the processing path and deliver it to an exchange position associated with a selected one of the process chambers from where it can be introduced into the selected one of the process chambers, the substrate being rotated approximately ninety degrees from the direction of movement along the processing path to the exchange position.

48. The apparatus of claim 47 wherein the substrate is removed from the selected one the process chambers by the transfer robot and rotated approximately ninety degrees before being returned to the storage location.

49. The apparatus of claim 48 wherein the transfer robot is movable along the processing path in a first direction to deliver the substrate to the exchange position and in a second direction opposite from the first direction to return the substrate to the storage location.

50. The apparatus of claim ⁴⁴47 wherein the processing path has a first side and a second side, and the process chambers are located along the first and second sides of the processing path.

51. The apparatus of claim ⁴⁴47 further including a track extending along the processing path on which the transfer robot moves.

52. The apparatus of claim ⁴⁵51 wherein the transfer robot is moveable along the track to a service position where it is accessible for maintenance or replacement, the service position being located at the second end of the processing path.

53. The apparatus of claim 47 wherein each process chamber is part of a processing island, the processing island further including:
an entry load lock chamber having a first valve through which a substrate can be introduced therein and an exit lock chamber having a second valve through which a substrate can

be extracted therefrom, the process chamber being located between the entry load lock chamber and the exit load lock chamber.

54. The apparatus of claim 53 wherein the entry load lock chamber is a heating chamber.

55. The apparatus of claim 53 wherein the exit load lock chamber is a cooling chamber.

56. The apparatus of claim 53 wherein the process chambers include one or more chambers configured to perform at least one of a CVD process, a PECVD process, an etching process, a cleaning process, a descumming process, a PVD process, and a post-anneal process.

54 57. The apparatus of claim 44 wherein the transfer robot includes an end effector to support the substrate, a horizontal linear actuator to horizontally translate the end effector, a vertical linear actuator to vertically translate the end effector, and a vertical rotary actuator to rotate the end effector about a vertical axis.

58. An apparatus to perform a process on a substrate, comprising.
means for storing a substrate at a first end of a substrate processing path;
a plurality of process chambers located adjacent to the processing path between the first end and a second end of the processing path;
means movable along the processing path for retrieving a substrate from the storing means and delivering it to an exchange position associated with a selected one of the process chambers from where it can be introduced into the selected one of the process chambers,